March 7, 2014

Letter – Expression of Interest
VIA ECFS

Chairman Thomas Wheeler
Commissioner Mignon Clyburn
Commissioner Jessica Rosenworcel
Commissioner Ajit Pai
Commissioner Michael O'Rielly
Jonathan Chambers
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: Expression of Interest – Rural Broadband Experiments
Connect America Fund, WC Docket No. 10-90

Dear Chairman Wheeler, Commissioners, and Mr. Chambers,

This letter is to express California Broadband Cooperative, Inc.'s interest in receiving funding from the Rural Broadband Experiments announced at the January 30th FCC Open Meeting. We are referring to this project as the "*Eastern Mojave – Death Valley VoIP Experiment*."

BACKGROUND

Below is a summary of our company and the organizational ecosystem that we have constructed for the implementation of the proposed experiment.

> **California Broadband Cooperative, Inc.** California Broadband Cooperative, Inc. (CBC) is a not-for-profit telephone cooperative based in Vallejo, California with offices in the Eastern Sierra and Reno Nevada. It was established to own and oversee the 600 miles of underground fiber optic that was created under a joint NTIA (BTOP) and CPUC grant program. Its primary mission was to bring broadband services into one of the more neglected areas of California. While an

exceedingly complex biological, cultural and topographical environment was encountered, the project was successfully completed within the scope of the BTOP grant in its entirely and 11% of California will have the benefits of Next Generation broadband. As a wholesale provider of broadband, it has similarly enabled local wireless and wire line broadband, including local LEC and cable incumbents to revitalize their business operations. There are 271 Community Anchors Institutions (CAIs) served by the network and there are 66 points of interconnect to other networks. This does not include dark fiber for the State of California for emergency and highway management, USDOD communications between branches of service, and the completion of rings for redundant routing by long-haul carriers. As of fall, 2013, the network was substantially completed and services began turning up. At this time, the network construction is completed and is fully operational between Barstow CA and Reno NV, thereby providing a link between two major east-west routes of the national Internet.

As a cooperative, CBC is an Open Access network enabling all ISPs, resellers, cellular and land-line companies to interconnect. Pricing is wholesale and at aggressive rates to encourage adoption of very high levels of bandwidth.

CBC has been working closely with the California Public Utility Commission and its California Advanced Services Fund (CASF) staff, who is charged with disbursing grants and other funds for the deployment of broadband. We have similarly been working with the California Telehealth Network, and the California Educational Network Infrastructure Corporation (CENIC) to advance Next Generation Broadband into those institutions. In the case of the Eastern Sierra, along Hwy 395, all schools and hospitals have been connected with between 1Gbps and 10Gbps services. In short, CBC is not only serious about broadband deployment, but also delivers on its construction obligations.

CBC operates within a greater organizational infrastructure to complete the delivery capability needed for a full network solution. **Praxis Optical Networks** project managed and self-performed all work needed on the Digital 395 build, ranging from underground construction, cable placing and splicing, node construction, network and operating systems integration, and provisioning. A related company, **Inyo Networks, Inc.,** serves as network operator for the CBC networks, bringing a level of expertise in customer support, NOC operations, and field operations.

Inyo Networks, Inc. In addition to its role as the network manager for the Region's Middle Mile service provider (CBC), Inyo Networks serves the area as a Last Mile, fiber optic-based service provider of major commercial customers. Presently, the combined networks of CBC and Inyo Networks provides the following services: IP Services up to 10Gbps, Point-to-Point Private Circuits, Dark Fiber, Wavelengths, Conduit Leasing, and Collocation. Inyo Networks, as a retail service provider plans to offer voice services throughout CBC and Inyo Networks customer base, which is in designated high cost service areas.

Construction Partner. Praxis Optical Networks ("Praxis'), the contractor overseeing and installing the aforementioned BTOP Middle Mile network, also has installed over 38,000 FTTP units for ATT and private entities. It is presently constructing a wireless system at the Reno Sparks Indian Colony in Nevada. Praxis provides permitting, network engineering and construction, systems integration. It has extensive experience with Federal and State grants processes and maintains processes to ensure compliance. In the past three years, Praxis Optical Networks successfully installed nearly 900 miles of grant-funded fiber and connected 350 CAIs.

State of California. The California Public Utilities Commission (CPUC) will provide aid to construction as a partner with a 20 to 30% share of grant funding from its California Advanced Services Fund (CASF), where the proposed work meets its qualification requirements. The CPUC will also serve as the lead agency for CEQA, which it did during the Digital 395 construction.

Inyo and San Bernardino County Support. Additional partners in this endeavor include the Counties of Inyo and San Bernardino, who will provide ROW on their roadways and real estate for towers, environmentally controlled nodes and other structures (heat in the area frequently reaches in the high 120 degrees Fahrenheit in summer months).

Death Valley National Park. The National Park Services are extremely interested in getting broadband and voice services into the Park. They are in the process of obtaining an Environmental Assessment on Roger's Peak for the placement of a microwave tower. Their cooperation and assistance in supporting sites for ground stations and nodes will also be critical.

Aware of the interest that the FCC has in evaluating the impact of these programs on the communities and its own policies, I would like to add that I have extensive background in program evaluation, which I largely performed at the federal and international levels. As a Director on the Board of CBC and principal of Inyo Networks, I hold a Ph.D. from UCLA where in my earlier career I was a research methodology specialist in the development of Quasi-Experimental Designs. This social science methodology utilized natural settings impacted by clearly identified interventions (defined by the specific nature of the change and exact timeframes when the effect took place. These methods have been extensively used in policy evaluations, where I employed them at the Department of State (USAID) and several other health and education policies worldwide. We believe this additional expert knowledge can be of significant use to the FCC in data-capture and related analytics, by analyzing patterns of adoption, changes in behavior and their financial impact. In recent years, I've taught advanced classes at the University of San Francisco's Graduate Program in Public Policy, where I concentrated on Emerging Technologies and the Digital Divide. Our selection of targeted tribal lands (at varying degrees of broadband introduction) is, in part, an effort to assess varying impact while leveraging existing infrastructure.

GEOGRAPHIC TERRITORY

CBC, in conjunction with Inyo Networks, as the last mile service provider and operator of voice/messaging services, intends to offer VOIP services to all CAIs and residents in the Tecopa, Shoshone, Charleston View, and Death Valley communities. In addition, by leveraging the FCC's own ConnectED and the USAC Telehealth Infrastructure grants program, we believe a complete solution can be achieved in the final area in one of the more remote and high cost to serve areas of the county.

Our plan, as depicted by Exhibit A, is to connect Shoshone, Tecopa, and Charleston View to the I-15 Internet corridor at Baker. From Shoshone or Olancha, depending on tower site availability in the Death Valley National Park (with whom we have been in discussions), we plan to use 3.4 Gbps microwave to extend services into the National Park at Furnace Creek. The tower system will also support cellular coverage, as needed to provide safety communications to Park visitors in one of the most forbidding environments on the planet. We plan to work with both the Department of the Navy (NAWS China Lake), who we have already been working with on other locations in the area to co-occupy a tower, or collaborate on an upgraded one.

The project has been fully engineered and is ready for an Environmental Assessment. Our Digital 395 experience with the agencies involved provides a clear path forward and we are fully cognizant of the needed BMPs to work through a rapid NEPA and CEQA effort.

Here are the FCC Listed Census Tracts, by County, that are impacted by this proposal for California and Nevada. All are in the High Cost Areas and correspond to the Eligible FCC Census Tract List.

Inyo CA 06027	San Bernardino CA 06071	Nye NV
6027000800	**06071010300**	**32031009010**

ELIGIBLE TELEPHONE CARRIER (ETC) STATUS

CBC holds a California and Nevada facilities-based Telephone Corporation Certificate of Public Convenience and Necessity (CPCN # U7221, and CPCN CPC2964, respectively.) Inyo Networks, Inc. currently holds a Certificate of Public Convenience and Necessity (CPCN # U7953C). We intend to submit for ETC status with the CPUC through the Advice Letter process that is outlined in CPUC Resolution T-17002 within 30 days. Inyo Networks is presently certified as a non-facility based carrier, but will file for a change in status by April, thus allowing construction on public rights-of-ways.

LIST OF ANCHOR INSTITUTIONS

The list of the 31 Community Anchor Institutions (CAIs) are presented in detail on Exhibit B.

PROPOSED TECHNOLOGY

The project will use a variety of broadband technology, some of which is in place and some proposed:

Wire Line Extension or Fiber Lateral (Proposed): Gig-E or 10Gbps Ethernet is proposed on the Baker / Shoshone / Tecopa / Charleston View segments.

Wireless Lateral Extension (Proposed): 4 Gbps Microwave link from Olancha to Roger's Peak (where CBC will utilize existing military tower for antenna), then hop to Furnace Creek.

Last Mile Land Line (Proposed): 1 Gbps PON FTTP is proposed for the following areas: Baker (CAI), Shoshone, Tecopa, Furnace Creek complex, and Timbisha Reservation.

Last Mile Wireless: a 20 Mbps per link minimum throughput, 5.8 GHz Point-to-Multipoint wireless Ethernet network is proposed for deployment to all dwellings on in Charleston View and Death Valley outside the immediate access to the microwave downlink into the Death Valley floor.

Switching: The project proposes a MetaSwitch MG620 Class 4/5 softswitch, to enable low cost VOIP voice, messaging, and trunking applications. In the event this project is jointly funded with the Tribal and CAI VoIP Trial filed by Inyo Networks, this switch would be unnecessary.

STATE AND/OR LOCAL OR TRIBAL GOVERNMENT PARTICIPATION IN AND/OR SUPPORT OF PROJECT

The Counties of Inyo, San Bernardino, and Nye (NV) will provide Rights-of-Way and inspection for any construction on County rights-of-way.

The State of California will provide financial assistance via CASF for Line Extension construction from Baker to Shoshone.

The project will take funding advantage of USAC Telehealth Infrastructure Grant Program for Heath Care Facilities and the FCC's ConnectED program for links to the schools.

EXISTING PROVIDERS

The following matrix provides information on services available on the geographical areas proposed in terms of Speed and Costs. The Community of Charleston View is a Telephone Exchange with no facilities:

	Incumbent LEC			*Cable*			*802.11 Wireless*		
Location	*Name*	*Voice*	*Data*	*Name*	*Voice*	*Data*	*Name*	*Voice*	*Data*
Baker, CA	*ATT*	*$57.99*	*None*	*None*	*No*	*No*	*None*	*None*	*Self*
Shoshone/Tecopa	*ATT*	*$57.99*	*None*	*None*	*No*	*No*	*None*	*None*	*None*
Charleston View	*None*			*None*			*None*		
Death Valley	*ATT*	*$57.99*	*None*	*None*			*None*		

Project Timeline

The timeline for this project is approximately three years: (1) 18-months for Section 106 NEPA and CEQA approvals, if and (2) 18-months for construction across seven reservations.

Scalability

The scalability of the networks in this proposal is significantly scalable.

Scalability of the Proposed Middle Mile Line Extensions
The network capacity of the Middle Mile is planned for 40 Gbps on four-strands of fiber using 4 of 96 wavelengths. The cable is a 144-Strand fiber backbone in a three-conduit structure (two ducts spare). Theoretic capacity of the Middle Mile is near 30 Petabytes, depending on available future electronics. There will be an additional conduit available for maintenance and future growth, as needed.

Scalability of Proposed Last Mile Solutions – FTTP
The proposed tribal distribution systems will be 10Gbps PON FTTP systems equipped. the current industry standard. In addition to VOIP services, tiered speeds to be offered under this Experiment will initially range from 25 to 100 Mbps of broadband service, with a 1Gbps cap. These facilities will be owned by CBC, once installed. Inyo Network will serve as network operator at the convenience of CBC.

Last Mile Scalability –Proposed Wireless 5.8 MHz wireless Ethernet distribution systems radios have a current throughput capacity of 250 Mbps per antenna sector. The expected life of electronics in these systems is usually between five-year and ten-year, with the change out of electronics enabling greater speeds. The current per-subscriber bandwidth of 20-50 Mbps is projected to meet needs well into the next decade or two.

Microwave Scalability: The proposed microwave system is state of the art, but is scalable via change out of electronics. We believe the 3.4 Gbps should more than adequately serve Death Valley for several decades.

Scalability of the Proposed Switch Equipment: Voice over IP, or more generally multimedia over IP, will set up interactive messaging, telephony and video conferencing over an IP network. The proposed soft switch vendor, Metaswitch, provides Class 5 End-Office equivalent VoIP and IMS network software products that are scalable. The project proposes a single installation on the Inyo Networks infrastructure in the existing service area. We are proposing a Metaswitch MG620 Class 4/5 Tandum unit with a simultaneous circuit capacity of 15,000 residential and commercial lines. This system is expandable by deploying additional shelves. As previously mentioned, this switch can be eliminated if the related *Tribal and CAI VoIP Experiment* proposed by Inyo Networks is funded.

Generally speaking, the upgrade capacity of all the elements of this network is extensive.

Total Business Investment

Due to recent experience with Federal Programs, California Broadband, Inyo Networks and Praxis Optical Networks have in place the necessary federal grant process and systems required by the FCC. There however, will be a requirement for the retention of administrative staff and project management for project oversight. While there will be little ramp up costs involved, we expect that in total the administrative apparatus to oversee the contract management, bonding, and financial oversight of this project through the three years to be **$800K**. This figure can be significantly reduced by 75% in the event the proposed *Tribal and CAI VoIP Experiment* was funded. (Synergistic savings are not computed in this Expression of Interest.)

The major portions of the route proposed is on BLM land. This is a desert tortoise habitat that we have recently deployed about 168 miles in adjacent lands. We have developed substantial monitoring and other BMPs that have been highly successful in protecting the animals. Based on recent experience, with this and Section 106 along the Old Spanish Highway, we believe environmental studies and monitoring could cost as much (with fees) as **$1.5MM.**

INVESTMENT NEEDED

The one-time investment by the FCC for the total project, including the Administrative overheads, is estimated to be **$8,662,500**. Upon completion, the projects will be self-sustaining.

LEVERAGING FUNDS AND PROJECTS

This project leverages several adjacent projects which have just completed or are in the process of completing:

The primary projects being leveraged is a concurrently proposed FCC Experiment, and the recently completed BTOP Middle Mile projects: (1) The Tribal and CAI VoIP Experiment has several redundant requirements if both projects are funded including the cost of the VoIP switch and administrative overheads; and (2) California Broadband Cooperative's Digital 395 Middle Mile $108MM fiber backbone project that spans the 600 miles on the Eastern Sierra between Barstow CA and Reno NV provides operational support and equipment that is reusable under NTIA rules for further broadband deployment. Finally, we believe the synergies of the aforementioned USAC Telehealth Infrastructure Grant Program for Heath Care Facilities and the FCC's ConnectED program for links to the schools will provide substantial cost benefits.

We expect this contribution by CASF to be **$2,887,500**, which is a 25% match to CPUC allowable costs (VoIP excluded).

TOTAL PROJECT COST

We estimate the cost of Last Mile engineering and construction, VOIP implementation, and overall project administration, including environmental analysis, project management and financial oversight to be **$11,550,000**

Thank you for considering our Expression of Interest. California Broadband Cooperative and its affiliated corporations have been extremely active over the past year to bring broadband to rural America. In the past three years we successfully executed on three major BTOP projects in California and Nevada. We look forward to working with the FCC on its experimental efforts to transform the structure of the communications sector of our economy.

Sincerely,

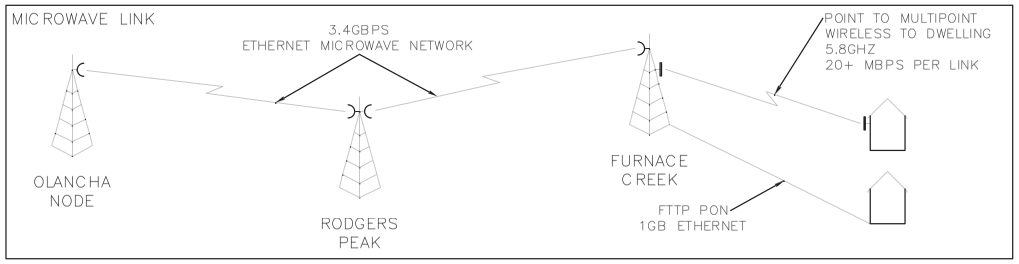
Robert W. Volker.
CEO and President
California Broadband Cooperative, Inc.

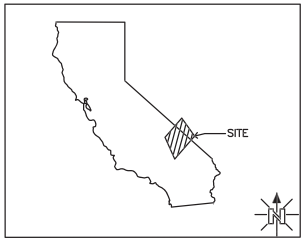
Exhibit B
Eastern Mojave Community Anchor Institutions

Name	Address	City	County	Latitude	Longitude	Type						
						Schools	Libraries	Medical	Public Safety	Higher Education	Comm Centers	Gvmnt Facilities
Baker Elementary School	72100 Schoolhouse Ln	Baker	San Bernardino	35.274833	-116.074837	X						
Baker High School	72100 Schoolhouse Ln	Baker	San Bernardino	35.275136	-116.073463	X						
Baker Valley Unified School Dist	72100 Schoolhouse Ln	Baker	San Bernardino	35.273267	-116.071727							X
Community Services District	72730 Baker Blvd	Baker	San Bernardino	35.273723	-116.062542						X	
Department of Public Works	72730 Baker Blvd	Baker	San Bernardino	35.273723	-116.062542							X
Emergency Medical Services	72730 Baker Blvd	Baker	San Bernardino	35.273723	-116.062542			X				
Senior Citizens Center	72730 Baker Blvd	Baker	San Bernardino	35.273723	-116.062542						X	
Sheriff's Department	72730 Baker Blvd	Baker	San Bernardino	35.273723	-116.062542				X			
CalTrans Maintenance Station	Hwy 127	Shoshone	Inyo	35.971609	-116.270902							X
Death Valley Chamber of Commerce	118 State Hwy 127	Shoshone	Inyo	35.974925	-116.269939							X
Death Valley Health Center	Old state Hwy 127	Shoshone	Inyo	35.978367	-116.272499			X				
Death Valley High School	Old state Hwy 127	Shoshone	Inyo	35.978881	-116.272718	X						
Death Valley Unified School District	Old state Hwy 127	Shoshone	Inyo	35.978408	-116.27316							X
Inyo County Maintenance Yard	Hwy 127	Shoshone	Inyo	35.968474	-116.270788							X
Inyo County Sheriff	Hwy 127	Shoshone	Inyo	35.974644	-116.269695				X			
Shoshone Elementary School	Charles Brown 127	Shoshone	Inyo	35.977835	-116.273098	X						
Shoshone Museum	118 State Hwy 127	Shoshone	Inyo	35.974923	-116.269939						X	
Inyo County Parks and Recreation	400 Tecopa Hot Springs Rd	Tecopa	Inyo	35.872237	-116.232827							X
Tecopa Community Center	400 Tecopa Hot Springs Rd	Tecopa	Inyo	35.848109	-116.225481						X	
Tecopa-Francis Elementary School	Old Spanish Trail Hwy	Tecopa	Inyo	35.848847	-116.216923	X						
Inyo County Health and Human Services	400 Tecopa Hot Springs Road	Tecopa	Inyo	35.871318	-116.23239			X				
Public Library Facility	400 Tecopa Hot Springs Road	Tecopa	Inyo	35.871318	-116.23239		X					
Death Valley Elementary	Hwy 127 (Death Valley Highway)	Furnace Creek	Inyo	36.504454	-116.869762	X		X				
Park EMS Station	Hwy 127 (Death Valley Highway)	Death Valley	Inyo	36.456936	-116.865734				X			
Fire Station	Hwy 127 (Death Valley Highway)	Death Valley	Inyo	36.456936	-116.865734				X			
Park Superintendent Office	Hwy 127 (Death Valley Highway)	Death Valley	Inyo	36.460097	-116.865853							X
Furnace Creek Community Center	Hwy 127 (Death Valley Highway)	Death Valley	Inyo	36.503409	-116.866616						X	
Stove Pipe Ranger Station	Hwy 127 (Death Valley Highway)	Death Valley	Inyo	36.606866	-117.146776							X
Death ValleyTimbisha Shosone Band of CA	Hwy 127 (Death Valley Highway)	Death Valley	Inyo	36.449814	-116.873594							X
Death Valley Library	Hwy 127 (Death Valley Highway)	Death Valley	Inyo	36.503454	-116.870336		X					
					Individual TypeTotals	6	2	4	4	0	5	10
					Critical Communtiy Facility Totals	**31**						

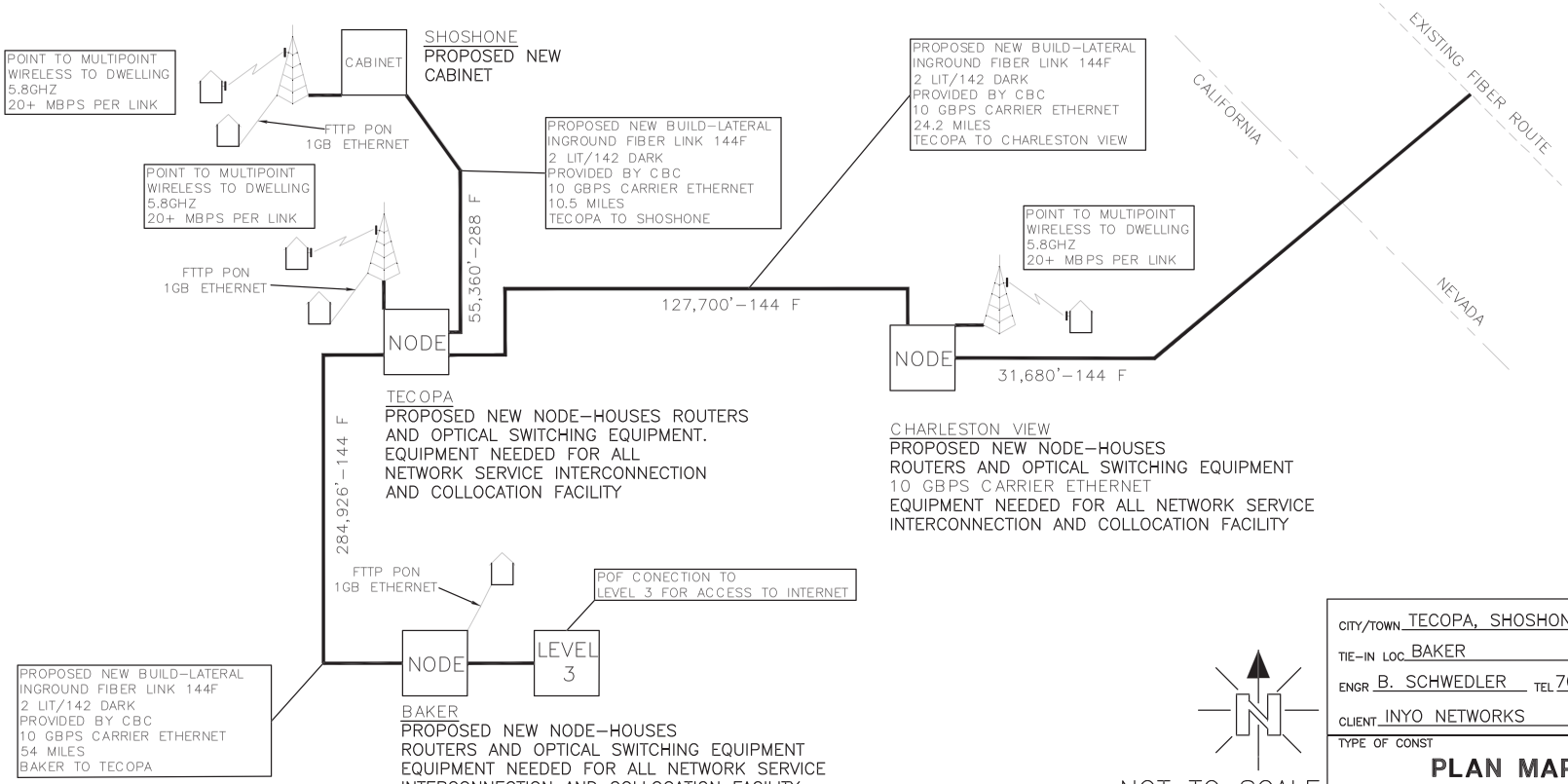
EAST MOJAVE \ DEATH VALLEY VoIP EXPERIMENT

EXHIBIT A





VICINITY MAP
N.T.S.



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NOT TO SCALE

VERSION DATE: 03–07–14

ENGINEERED BY PRAXIS ASSOCIATES 707.551.8200

CITY/TOWN TECOPA, SHOSHONE, C. VIEW

TIE–IN LOC BAKER

ENGR B. SCHWEDLER TEL 707–551–8200

CLIENT INYO NETWORKS

TYPE OF CONST

PLAN MAP

JOB NO EAST MOJAVE BROADBAND

DWG 1 OF 18 DESIGN 1